2007 RESEARCH PROBLEM STATEMENT

Problem Title: Evaluating the level of accuracy of truck traffic data on state highways **No.:** 07.05-1

Submitted By: Bill Lawrence (UDOT) and Prof. Mitsuru Saito (BYU) **Email:** billlawrence@utah.gov and msaito@byu.edu

Project Champion: Lee Theobald & Dan Kuhn

(UDOT or FHWA employee who needs this research done, will help the Research Division lead this project, and will spearhead the implementation of the results. If the project gets prioritized at the UTRAC conference, a Champion Commitment Form will be required before funding.)

1. Briefly describe the problem to be addressed.

As Prof. Saito and his research assistant worked on the development of user cost estimation procedures for work zones two years ago, they realized that UDOT's truck traffic data might not be as accurate as they wished. Truck traffic significantly alters the amount of user costs incurred by delays caused by work zones. Truck traffic plays an important role in many aspects of UDOT's daily activities, including transportation planning, highway operational analysis, and pavement and bridge designs. At planning level, movements of trucks on the state highway system will help UDOT properly allocate their highway funds; at operational level, truck traffic is essential for evaluating the capacity and level of service of transportation facilities; and at design level, truck traffic is a main factor for designing pavement structure and super and substructures of bridges. Therefore, it is essential that UDOT has a clear idea about the level of accuracy of their truck traffic data. Currently, the level of accuracy of truck traffic data is not clearly known. This proposed research will first evaluate the level of accuracy of the current truck traffic data by a statistical sampling of automatic data collection sites and typical traffic count tools for control counts and study methods for estimating truck traffic on state highways with a desired level of accuracy, and recommend future data collection and reduction methods for estimating truck traffic on state highways.

2. Strategic Goal: ☒ Preservation ☒ Operation ☒ Capacity ☒ Safety (check all that apply)

3A. List the research objective(s) to be accomplished:

1. Prepare a summary of state-of-the-art and state-of-the-practice of truck traffic data collection, reduction, and estimation methods
2. Determine the accuracy level and confidence interval of the current truck traffic data
3. Recommend directions and methods for improving the level of accuracy of truck traffic data

3B. List the major tasks to accomplish the research objective(s): **Estimated person-hours:** 1800

1. Conduct a literature search for state-of-the-art traffic classification methods and count station sampling methods that will improve the accuracy level of truck traffic data
2. Conduct a survey of state DOTs for the state-of-the-practice of truck traffic data collection, reduction, and estimation methods and their accuracy levels and review UDOT's current truck traffic estimation method (including a review of UDOT's current truck traffic estimation method)
3. Design a stratified sampling of permanent traffic count stations and typical traffic counters for control counts for field data collection (video data collection)
4. Coordinate the scheduling of field data collection scheduling in order for the research team to extract traffic count data from UDOT's permanent count stations for the exact date, time, and duration of field data collection.
5. Videotape traffic at selected permanent count stations following the data collection schedule determined in task 4
6. Conduct a statistical analysis to determine the accuracy level of current truck traffic data
7. Recommend future directions for data collection, reduction, and estimation that will improve the accuracy level of truck traffic data
8. Prepare a final report

4. Estimate the cost of this research study including implementation effort (use person-hours from No. 3B): $45,000

5. Indicate type of research and/or development project this is

Large: ☒ Research Project ☐ Development Project
Small: ☐ Research Evaluation ☐ Experimental Feature ☐ New Product Evaluation ☐ Tech Transfer Initiative
☐ Other:

6. Outline the proposed schedule (when do you need this done, and how will we get there):

It is recommended to begin this study in summer, either June or July, as UDOT's new budget cycle begins and as soon as funds are available. It is anticipated that the project will last about 12 to 18 months depending on the number of sites selected to achieve the level of statistical accuracy desired.

7. What type of entity is best suited to perform this project (University, Consultant, UDOT Staff, Other Agency, Other)?

University and the Planning and Statistics Departments of UDOT

8A. What deliverables would you like to receive at the end of this project? (e.g. useable technical product, design method, technique, training, workshops, report, manual of practice, policy, procedure, specification, standard, software, hardware, equipment, training tool, etc.)

1. A report describing the current level of accuracy of truck traffic counts
2. A report summarizing state-of-the-practice and state-of-the-art of truck traffic count estimation methods
3. A new method(s) to achieve and maintain the desired accuracy level of truck traffic data for Utah's state highways

8B. Describe how this project will be implemented at UDOT.

1. Level of confidence in truck traffic data can be disseminated to the users of truck traffic data
2. The new method(s) to achieve and maintain the desired level of accuracy of truck traffic data can be immediately incorporated into the daily activities of the Planning and Statistics Departments of UDOT

8C. Describe how UDOT will benefit from the implementation of this project, and who the beneficiaries will be.

Improved accuracy in truck traffic data will help UDOT's planning, operation and design work to be more reliable and realistic. Truck traffic affects a wide range of UDOT's daily work. User cost estimation will be more accurate, operational evaluation of traffic flow will become more realistic, and pavement and bridge design will prove to be more cost effective.

9. Describe the expected risks and obstacles as well as the strategies to overcome them.

No risk is expected. However, close coordination between the Statistics Department and the Researchers is needed to correctly extract traffic classification data from the permanent count stations for the location, time, and duration of field data collection activities.

10A. List other people (UDOT and non-UDOT) who are willing to participate in the Technical Advisory Committee (TAC) for this study:

Name	Organization / Division / Region	Phone	Email
Lee Theobald	UDOT Planning Statistics	801-965-4560	
Mitsuru Saito	BYU	801-422-6326	msaito@byu.edu
Michael Kaczorowski	UDOT Planning	801-965-4152	MKACZOROWSKI@utah.gov
Daniel Kuhn	UDOT Program Development	801-965-4148	dkuhn@utah.gov
	Motor Carrier		
	Utah Trucking Assoc.		

10B. Identify other Utah, regional, or national agencies and other groups that may have an interest in supporting this study:

FHWA, NCHRP